

CLAIMS:

1. A wound treatment apparatus comprising:  
a bandage configured to cover a wound and provide a seal about the  
5 perimeter of the wound, the bandage providing a cavity over the wound, a fluid supply  
in communication with the cavity, and a fluid drainage in communication with the  
cavity.
2. The apparatus of claim 1, further comprising a nebulizer  
coupled to the fluid supply.
- 10 3. The apparatus of claim 1, further comprising a liquid medication  
pump coupled to the fluid supply.
4. The apparatus of claim 1, further comprising a vacuum pump  
coupled to the fluid drainage, said bandage providing a relatively closed space above  
the wound to be held at a negative pressure.
- 15 5. The apparatus of claim 1, further comprising a recirculating,  
temperature regulated fluid tube coupled to the bandage.
6. The apparatus of claim 5, further comprising a heater and a  
circuitous fluid pathway coupled to the recirculating, temperature regulated fluid tube.
7. The apparatus of claim 6, further comprising a temperature  
20 sensor coupled to the recirculating, temperature regulated fluid tube.
8. The apparatus of claim 7 further comprising a controller and a  
cut-off valve, the controller being coupled to the temperature sensor and the cut-off  
valve, the cut-off valve being coupled to the fluid supply tube, and the controller being  
configured to activate the cut-off valve based on a signal from the temperature sensor.
- 25 9. The apparatus of claim 3, further comprising an oxygen supply  
coupled to the fluid supply.
10. The apparatus of claim 9, further comprising an oxygen supply,  
an air supply, and a valve system, the valve system having a first input coupled to the  
oxygen supply, a second input port coupled to the air supply, and an output port  
30 coupled to the medicinal fluid supply device.
11. The apparatus of claim 10, wherein the valve system is a dual  
input selector valve.

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12. The apparatus of claim 1, further comprising a pressure sensor coupled to the fluid supply tube.

13 The apparatus of claim 12, further comprising a pressure sensor coupled to the fluid supply tube, and a controller coupled to the pressure sensor and a display, the controller being configured to cause an indicia to appear on the display based on a value received by the controller from the pressure sensor.

14. The apparatus of claim 12, further comprising a controller coupled to the pressure sensor and configured to signal an alarm if a value received by the controller from the pressure sensor exceeds a predetermined threshold.

15 15. The apparatus of claim 1, further comprising a gasket configured to be coupled between the bandage and a skin surface about the wound.

16. The apparatus of claim 1, wherein the bandage comprises a two-piece bandage assembly including a supply bandage configured to seal the wound and provide the said cavity and a drainage bandage configured to be coupled to the supply bandage.

17. The apparatus of claim 1, wherein the bandage comprises a fluid delivery conduit, said conduit being configured to be positioned near a wound to deliver fluid to the wound, and a fluid drainage conduit having at least one fluid collection opening, the conduit being positioned about the wound.

18. The wound treatment apparatus of claim 16, wherein the fluid delivery conduit has a flare.

19. The wound treatment apparatus of claim 16, in which said bandage covers the fluid delivery and drainage conduits forming a closed space over and about the wound.

20. The apparatus of claim 2, further comprising a sensor coupled to the nebulizer and configured to provide a signal indicative of an amount of fluid within the nebulizer.

21. The apparatus of claim 12, wherein the sensor is an acoustic sensor.

22. The apparatus of claim 12, further comprising a controller coupled to the sensor and configured to determine if a nebulizer fluid reservoir contains a fluid based on values received by the controller from the sensor.

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23. The apparatus of claim 2, further comprising an electronic control system coupled to the nebulizer to control nebulizer output.

24. A wound treatment apparatus comprising:

a first bandage configured to cover a wound, the first bandage including  
5 a first surface configured to face toward the wound, at least one fluid delivery passageway through the first surface, and at least one fluid drainage passageway through the first surface;

a fluid delivery conduit in communication with the fluid delivery passageway;

10 a second bandage configured to be coupled with the first bandage, the second bandage including a second surface configured to face toward the first bandage and provide a fluid space between the surfaces; and

a fluid drainage conduit in communication with the fluid drainage passageway.

15 25. The apparatus of claim 24, wherein the at least one delivery passageway comprises a plurality of delivery passageways.

26. The apparatus of claim 25, wherein the plurality of delivery passageways is arranged in a substantially circular pattern.

27. The apparatus of claim 24, further comprising a fluid drainage  
20 receptacle coupled to the fluid drainage tube.

28. The apparatus of claim 27, further comprising a filter coupled to the fluid drainage receptacle.

29. The apparatus of claim 24, wherein the first bandage comprises a first flexible relatively impermeable sheet including the first surface, and the second  
25 bandage comprises a second flexible relatively impermeable sheet including the second surface, said second bandage providing a close space over the wound to be held at a negative pressure.

30. The apparatus of claim 24, further comprising a gasket configured to be coupled between the bandage and a perimeter of healthy tissue  
30 surrounding the wound to provide a relatively closed space about the wound to be held at a negative pressure.

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31. The apparatus of claim 24, wherein the fluid space is segregated into a first chamber and a second chamber, wherein the first chamber is formed about the fluid delivery passageway and the second chamber is formed about the fluid drainage passageway.

5 32. The apparatus of claim 31, wherein the fluid delivery conduit is in communication with the first chamber and the fluid drainage conduit is in communication with the second chamber.

33. A wound treatment apparatus comprising:  
a bandage including a wound facing surface configured to face toward  
10 the wound and a fluid drainage passageway having an opening adjacent the wound facing surface;

a fluid drainage tube coupled to the fluid drainage passageway;  
first and second fluid drainage receptacles coupled to the drainage tube;

and

15 first and second valves coupled between the fluid drainage tube and the first and second fluid drainage receptacles, respectively.

34. The apparatus of claim 33, wherein the valves are pinch valves.

35. The apparatus of claim 33, further comprising a sensor coupled  
to the first fluid drainage receptacle to provide a signal indicative of an amount of fluid  
20 in the receptacle.

36. A wound treatment apparatus comprising:

a cover bandage configured to cover a wound and provide a seal on  
healthy skin tissue about the perimeter of the wound, said cover to provide a relatively  
closed space about the wound to be held at negative pressure;

25 a fluid supply conduit fitted between the cover bandage and healthy skin tissue near the wound; and

a fluid drainage conduit having at least one fluid drainage opening,  
fitted between the cover bandage and healthy skin tissue and positioned on healthy skin  
tissue about the wound and the fluid supply.

30 37. The apparatus of claim 36, further comprising a medicinal fluid supply in communication with the fluid supply conduit.

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38. The apparatus of claim 36, further comprising a drainage receptacle in communication with the fluid supply conduit and a vacuum.

39. The apparatus of claim 36, wherein the fluid drainage conduit has a bendable wire extended through the length of the conduit.

5 40. A wound treatment apparatus comprising:

a cover bandage providing a closed seal about a wound and a relatively closed cavity over the wound to be held at a negative pressure, the cover bandage including a first surface configured to face toward the wound, at least one fluid delivery passageway through the first surface, and at least one fluid drainage passageway through the first surface, a second surface configured to face toward the first surface and provide a fluid space between the surfaces; the fluid space is segregated into a first chamber and a second chamber, wherein the first chamber is formed about the fluid delivery passageway and the second chamber is formed about the fluid drainage passageway;

10 a fluid delivery conduit in fluid communication with the first chamber and the fluid delivery passageway; and

a fluid drainage conduit having at least one fluid drainage opening, in fluid communication with the second chamber and the fluid drainage passageway.

41. The apparatus of claim 40, wherein the fluid drainage conduit is positioned within the first chamber.

20 42. A wound treatment apparatus comprising:

a cover bandage providing a closed seal about a wound positioned on a joint having a cavity over the wound sized to receive the joint and to be held at a negative pressure, the cover bandage including a first surface configured to face toward the wound, at least one fluid delivery passageway through the first surface, and a second surface configured to face toward the first surface providing a fluid space between the surfaces;

25 a fluid delivery conduit in fluid communication with the fluid space and the fluid delivery passageway; and

30 a fluid drainage conduit having at least one fluid drainage opening, in fluid communication with the cavity.

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43. The apparatus of claim 42, further comprising a heater and heat sensor coupled to the cover bandage.

44. The apparatus of claim 43, further comprising a heater and heat sensor coupled to the cover bandage and to a nebulizer.

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